Trend Study 9-22-00

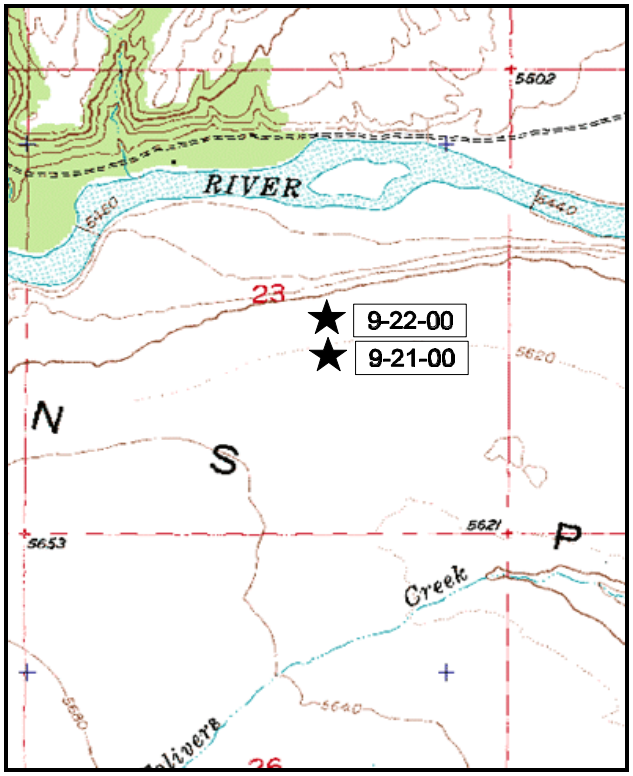
Study site name: Browns Park River Corridor-Wildlife . Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 68°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

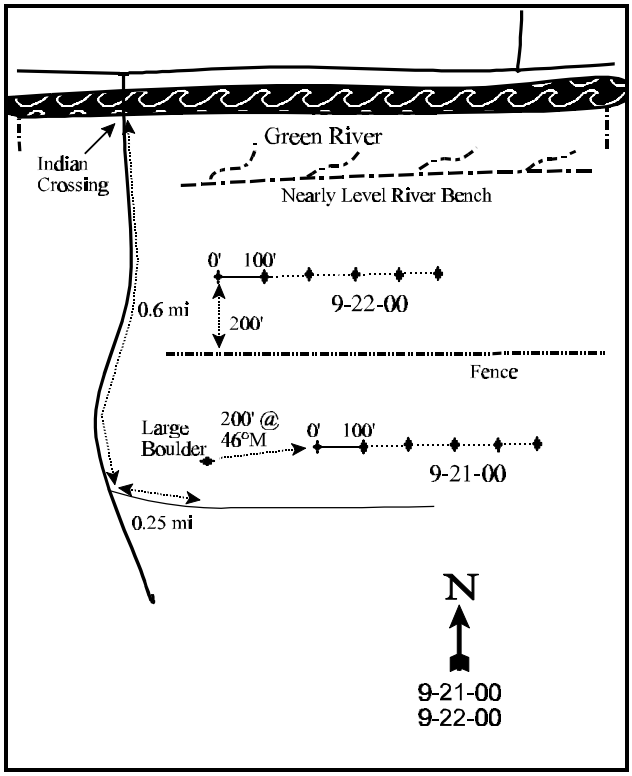
LOCATION DESCRIPTION

From the Indian Crossing bridge at Browns Park travel south for 0.6 miles to a fork. Tun left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder walk north to the fence at a bearing of 0°M. From the fence the 0-foot baseline stake is another 200 feet away. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.




Map Name: Clay Basin

Township 2N , Range 24E ,Section 23




Diagrammatic Sketch

UTM 4528444.094 N, 654014.211 E

## DISCUSSION

### Trend Study No. 9-22

The Brown's Park River Corridor-Wildlife study is a new site established in 2000. This study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line. This study samples the north side of the fence that is not accessible to livestock. The area is approximately ½ mile south of the Green River at Brown's Park on a sagebrush-grass flat. The site is nearly flat, but has a slight slope of 1-2% and a north aspect. Elevation is 5,600 feet. Pellet group data taken along the baseline in 2000 estimates 40 deer days use/acre (99 ddu/ha). Soil is a sandy loam in texture and moderately deep with an estimated effective rooting depth of over 13 inches. Soil reactivity is moderately alkaline (pH of 7.9) and phosphorus is low at 3.9 ppm. Phosphorus levels below 10 ppm may limit normal plant growth and development. Bare soil is high at 40%, while protective cover from vegetation and litter are moderately low at 28% and 21% respectively. Pavement is abundant on the surface at an estimated 20% cover. Presently, erosion is minimal due to the gentle slope and the abundance of grass cover (74% of total vegetation cover).

Wyoming big sagebrush is the dominant browse and key species on this site. Density is estimated at 2,240 plants/acre with high decadency (46%) and low recruitment (1%). In addition, 63% of the decadent class is classified as dying which represents 660 plants/acre that could be lost to die-off. With recruitment being low, this population could decrease in the future. Poor vigor is high at 32%, and leader growth is low averaging only 2-3 inches in 2000. Use is mostly light to moderate with low heavy use (2%). With big game use being light at the present time, high decadency, poor vigor and low recruitment can be attributed to drought, intraspecific competition between sagebrush plants and interspecific competition with needle-and-thread grass. Drought related increases in decadency and poor vigor in sagebrush communities have been documented on several other trend studies in this region in 2000. With high competition from needle-and-thread and very low precipitation, young plants will have a difficult time becoming established and persisting on this site.

Other browse sampled on this site are: shadscale, broom snakeweed and pricklypear cactus. Shadscale is estimated at 2,340 plants/acre, with the population consisting mostly of mature and decadent plants. Like Wyoming big sagebrush, percent decadency is high at 36% and recruitment is low at 2%. Those with poor vigor is estimated at 15%. Again, drought and competition with sagebrush and needle-and-thread are likely the key factors influencing these downward parameters for shadscale. Broom snakeweed is present, but is not nearly as abundant as it is on study 9-21 across the fence line. Density is estimated at 1,740 plants/acre, with very high decadency at 64%. Drought and high competition with other species appears to be getting the best of the snakeweed population here.

The herbaceous understory is comprised of mainly one species, needle-and-thread grass. This species provides over 18% average cover on the site, which represents 95% of the herbaceous cover and 70% of the total vegetative cover of the site. Squirreltail and sand dropseed are present in low frequencies as well. Two annual species, cheatgrass and sixweeks fescue, were sampled but are insignificant. Forbs are very rare with only two species being sampled in 2000.

#### 2000 TREND ASSESSMENT

Trend for soil appears stable. Although litter and vegetation cover are moderately low and bare ground is abundant, erosion is not severe due to the gentle slope and abundant cover from needle-and-thread grass. Browse is currently in poor condition with high decadency and poor vigor on Wyoming big sagebrush and shadscale. Recruitment from young plants is low for both species. Drought and high competition are apparently the key

factors influencing these downward parameters. The herbaceous understory appears stable, but composition is poor with needle-and-thread dominating the site. All other species, both grasses and forbs, are insignificant on this site.

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 22

| Type | Species | Nested Frequency '00 | Quadrat Frequency '00 | Average Cover % '00 |
|---|---|---|---|---|
| G | Bromus tectorum (a) | 8 | 4 | .04 |
| G | Sitanion hystrix | 42 | 20 | .80 |
| G | Stipa comata | 324 | 96 | 18.66 |
| G | Vulpia octoflora (a) | 4 | 1 | .03 |
| Total for Annual Grasses | | 12 | 5 | 0.07 |
| Total for Perennial Grasses | | 366 | 116 | 19.47 |
| Total for Grasses | | 378 | 121 | 19.54 |
| F | Descurainia pinnata (a) | 5 | 1 | .00 |
| F | Townsendia incana | 1 | 1 | .00 |
| Total for Annual Forbs | | 5 | 1 | 0.00 |
| Total for Perennial Forbs | | 1 | 1 | 0.00 |
| Total for Forbs | | 6 | 2 | 0.00 |

BROWSE TRENDS --
Herd unit 09 , Study no: 22

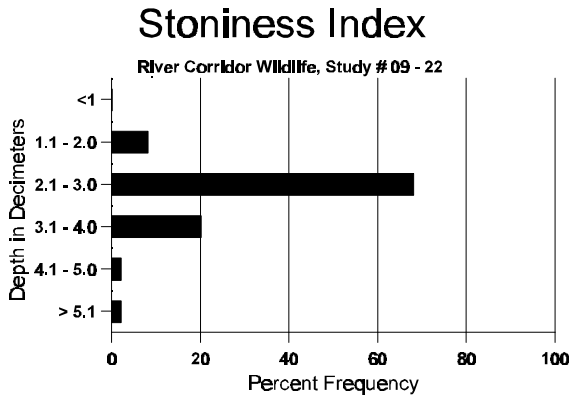
| Type | Species | Strip Frequency '00 | Average Cover % '00 |
|---|---|---|---|
| B | Artemisia tridentata wyomingensis | 53 | 3.39 |
| B | Atriplex confertifolia | 72 | 2.25 |
| B | Gutierrezia sarothrae | 28 | .73 |
| B | Opuntia spp. | 10 | .56 |
| Total for Browse | | 163 | 6.94 |

BASIC COVER --
Herd unit 09 , Study no: 22

| Cover Type | Nested Frequency '00 | Average Cover % '00 |
|---|---|---|
| Vegetation | 353 | 27.92 |
| Rock | 23 | .07 |
| Pavement | 381 | 20.76 |
| Litter | 442 | 30.07 |
| Cryptogams | 260 | 6.69 |
| Bare Ground | 410 | 40.15 |

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 22, Study Name: River Corridor Wildlife

| Effective rooting depth (inches) | Temp °F (depth) | pH | %sand | %silt | %clay | %0M | PPM P | PPM K | dS/m |
|---|---|---|---|---|---|---|---|---|---|
| 13.50 | 62.2 (13.70) | 7.9 | 59.6 | 23.1 | 17.3 | 0.7 | 3.9 | 150.4 | 0.5 |




PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 22

| Type | Quadncy Frequency '00 | Pellet Transect | |
|---|---|---|---|
| | | Pellet Groups per Acre (ha) '00 | Days Use per Acre (ha) '00 |
| Rabbit | 9 | 296 | N/A |
| Deer | 24 | 513 | 40 (99) |
| Grouse | - | 9 | N/A |

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 22

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Artemisia tridentata wyomingensis | | | | | | | | | | | | | | | | | | |
| Y | 00 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| M | 00 | 51 | 6 | 2 | - | - | - | - | - | - | 56 | - | 3 | - | 1180 | 12 | 22 | 59 |
| D | 00 | 40 | 12 | - | - | - | - | - | - | - | 19 | - | - | 33 | 1040 | | | 52 |
| X | 00 | - | - | - | - | - | - | - | - | - | - | - | - | - | 2360 | | | 118 |
| % Plants Showing '00 | | | | Moderate Use 16% | | | Heavy Use 02% | | | | Poor Vigor 32% | | | | | %Change | | |
| Total Plants/Acre (excluding Dead & Seedlings) | | | | | | | | | | | | | '00 | | 2240 | Dec: | | 46% |
| Atriplex confertifolia | | | | | | | | | | | | | | | | | | |
| Y | 00 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| M | 00 | 42 | 1 | - | 28 | 2 | - | - | - | - | 72 | - | 1 | - | 1460 | 8 | 14 | 73 |
| D | 00 | 33 | - | - | 9 | - | - | - | - | - | 25 | - | 2 | 15 | 840 | | | 42 |
| X | 00 | - | - | - | - | - | - | - | - | - | - | - | - | - | 400 | | | 20 |
| % Plants Showing '00 | | | | Moderate Use 03% | | | Heavy Use 00% | | | | Poor Vigor 15% | | | | | %Change | | |
| Total Plants/Acre (excluding Dead & Seedlings) | | | | | | | | | | | | | '00 | | 2340 | Dec: | | 36% |
| Gutierrezia sarothrae | | | | | | | | | | | | | | | | | | |
| M | 00 | 29 | - | 1 | 1 | - | - | - | - | - | 16 | - | 15 | - | 620 | 5 | 7 | 31 |
| D | 00 | 55 | - | - | 1 | - | - | - | - | - | 1 | - | 4 | 51 | 1120 | | | 56 |
| X | 00 | - | - | - | - | - | - | - | - | - | - | - | - | - | 640 | | | 32 |
| % Plants Showing '00 | | | | Moderate Use 00% | | | Heavy Use 01% | | | | Poor Vigor 80% | | | | | %Change | | |
| Total Plants/Acre (excluding Dead & Seedlings) | | | | | | | | | | | | | '00 | | 1740 | Dec: | | 64% |
| Opuntia spp. | | | | | | | | | | | | | | | | | | |
| M | 00 | 12 | - | - | - | - | - | - | - | - | 12 | - | - | - | 240 | 3 | 12 | 12 |
| D | 00 | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | 20 | | | 1 |
| % Plants Showing '00 | | | | Moderate Use 00% | | | Heavy Use 00% | | | | Poor Vigor 08% | | | | | %Change | | |
| Total Plants/Acre (excluding Dead & Seedlings) | | | | | | | | | | | | | '00 | | 260 | Dec: | | 8% |

BROWN'S PARK RIVER CORRIDOR TREND STUDY COMPARISON

Trend studies 9-21 (River Corridor-Livestock) and 9-22 (River Corridor-Wildlife)

2000 data comparisons

| | River Corridor-Livestock (accessible to livestock) | River Corridor-Wildlife (inaccessible to livestock) |
|---|---|---|
| **Wyoming big sagebrush** | | |
| Average cover (%) | 9.2 | 3.4 |
| Density (plants/acre) | 3,740 | 2,240 |
| % young | 7 | 1 |
| % decadent | 29 | 46 |
| % decadent/dying | 40 | 63 |
| % poor vigor | 12 | 32 |
| **Shadscale** | | |
| Average cover (%) | 1.3 | 2.3 |
| Density (plants/acre) | 1,720 | 2,340 |
| % young | 6 | 2 |
| % decadent | 37 | 36 |
| % decadent/dying | 28 | 36 |
| % poor vigor | 10 | 15 |
| **Broom snakeweed** | | |
| Average cover (%) | 7.1 | 0.7 |
| Density (plants/acre) | 39,460 | 1,740 |
| **Needle-and-thread grass** | | |
| Average cover (%) | 6.6 | 18.7 |
| **Ground cover** | | |
| Vegetation cover (%) | 25.9 | 27.9 |
| Litter cover (%) | 12.5 | 30.1 |
| Bare ground (%) | 54.5 | 40.2 |

Although total vegetation cover is about the same on both sides of the fence line, the nature of the vegetation is quite different. Seventy-one percent of the vegetation cover on the livestock accessible side comes from browse with only 29% being provided by herbaceous species. In contrast, 74% of the vegetation cover on the side not accessible to livestock (no grazing) is provided by herbaceous species, with only 26% coming from browse. Litter cover is low on both sides of the fence, but extremely so on the side accessible to livestock grazing. Bare ground is high on both sides of the fence as well, but more so on the side where livestock grazing occurs.

Herbaceous vegetation consists primarily of one species on both sites, needle-and-thread grass. However, this species provides nearly 3 times more average cover on the side not grazed by livestock.

The shrub component on these sites appears to be suffering from drought and competition. Wyoming big sagebrush and shadscale on both sites show high decadency and a higher than normal proportion of plants displaying poor vigor. With use currently being mostly light to moderate on both sites, high decadency and poor vigor can be attributed more to drought and competition than to any other factors. Decadency in the Wyoming big sagebrush population is higher on the side not accessible to livestock grazing. Recruitment from young plants is much lower for both sagebrush and shadscale on this side of the fence as well. Shrubs have higher competition on the side not accessible to livestock grazing because needle-and-thread grass provides nearly 3 times more cover. Thus, there are fewer microsites available for young plants to establish due to higher perennial grass cover, and more competition for resources.